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Service Providers' Perceptions of Universal Newborn Hearing Screening and Intervention Training Needs

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Abstract: *Following the initial implementation of universal newborn hearing screening initiatives currently required by law in most states, there is a need to move beyond the hospital follow-up to the delivery of services and support for children identified with hearing loss. A cadre of trained providers is needed to deliver these services. In order to provide training to professionals from varied backgrounds and disciplines expediently, one state provided training in a multidisciplinary context. Such an approach encourages broader follow-up, consistency across providers, and an enhanced multidisciplinary perspective for fostering collaboration across public and private providers. Results of trainees' self-assessments of their level of preparedness on specific objectives prior to and after eight training sessions are reported in this article. Significant increases were evident in participants' reported knowledge of and perceived ability to implement identified objectives. Qualitative results illustrated that participants gained knowledge of intervention strategies and techniques and expressed a desire for further training in this area.*

A number of states have adopted laws for implementation of universal newborn hearing screening and intervention initiatives (UNHSI) (Arehart, Yoshinaga-Itano, Thomson, Gabbard, & Brown, 1998). Compelling research shows that intervention prior to six months of age promotes gains in language development for young children who are deaf or hard of hearing (Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998). The long-term effectiveness of UNHSI is dependent upon the ability and efficiency of follow-up by the various service providers serving individual children with hearing loss (Arehart & Yoshinaga-Itano, 1999; Clarkson, Vohr, Blackwell & White, 1994; Finitzo, Albright, & O'Neal, 1998; Mencher, Davis, DeVoe, Beresford, & Bamford, 2001; Roush, 1990). The focus of early UNHSI efforts has been to provide hospital screening and follow-up testing to identify children with hearing loss, to provide amplification as needed (Finitzo et al., 1998; Thompson et al. 2001), and to connect identified children and their families to early intervention services (Clarkson et al., 1994; Dalzell et al., 2000; Finitzo et al., 1998; Gatty, 1996; Kramer & Williams, 1993), including services for the implantation of cochlear implants where appropriate (Pisoni, Cleary, Geers, & Tobey, 1999; Roush, 1990).

It is important that early intervention for young children and their families moves beyond the identification of hearing loss and provision of technological interventions such as hearing aids or cochlear implants (Easter-

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TESE, **Volume 28, No. 1**
Winter 2005

brooks, 1999; Gatty, 1996). However, there is a lack of coordination within many states for linking services from diagnosis to intervention (Arehart & Yoshinaga-Itano, 1999; Arehart et al., 1998). There has been little published regarding training personnel who work within various statewide systems to provide comprehensive follow-up interventions with children with a hearing loss. Journals in the early intervention field have only recently begun to address follow-up by providers through sharing information and practical resources such as web sites for further information (Widen, Bull, & Folsom, 2003).

In addition to problems in linkages between diagnosis and follow-up, the system of service delivery may be complex. An infant identified with a hearing loss in an initial hospital screening may be seen for services from multiple providers by the time he or she reaches first grade. For instance, the providers of services often change when the child turns age 3 and moves from early intervention (EI) to preschool and then to elementary school under the Individuals with Disabilities Education Act (1997). These changes are due to state and federal regulations mandating services, funding options such as private insurance or Medicaid, and the existence of multiple providers within private agencies. Providers may include an audiologist, local health district service coordinator, local health district nurse, speech and language pathologist, early interventionist, school district providers (e.g., teacher of the hearing impaired, kindergarten teacher), as well as other therapists.

In addition to the number of providers who may be serving the child and family within the first few years, there may be differing opinions regarding initial technological interventions to be utilized (Samson-Fang, Simons-McCandless, & Shelton, 2000). Opinions vary regarding types of hearing aids, for instance, where the choice may be dependent upon funding source, or the advantages of cochlear implantation and choice of that technology for the individual child. As the goals set for Healthy People 2010 by the U.S. Department of Health and Human Services (2000) promote appropriate intervention by six months of age, many decisions made early in the child's life impact the provision of appropriate services by multiple providers throughout the remainder of the child's preschool years and beyond.

An efficient method to train a number of providers from multiple disciplines may be to include them within the same training session. The importance and challenge of training multidisciplinary team members in a systems approach has been emphasized (Bailey, 1989). In their testimony to the President's Commission on Excellence in Special Education, Wolery and Bailey (2002) pointed out the need for training those who provide early intervention "to ensure that they are delivering early intervention in ways that are consistent with empirically-based recommended practices" (p. 97). Further, federal law (IDEA, 1997) mandates such a multidisciplinary perspective.

A difficulty with this approach is that providers come with a wide range of preexisting knowledge, especially those in fields in which hearing loss may be a major focus of their discipline, such as speech and language pathologists, audiologists, or specialists in the education of children who are deaf and hard of hearing. Even for those with considerable prior knowledge, the advent of universal newborn hearing screening laws and initiatives has generated new procedures for referral and follow-up, the need for collaboration with other service providers from both private and public agencies, and the increased need for consistency among providers who may have differing views of service delivery. The workplace may also present barriers to collaboration in spite of team members' willingness to cross agency and discipline boundaries (Garland & Frank, 1997).

Method

Some providers, even those with higher levels of knowledge, may still need training in regard to collaboration, referral, and follow-up. One state's initial training efforts in UNHSI are presented herein. Training was delivered to multiple providers across disciplines and agencies. An evaluation of the trainees' perceptions of their training was conducted. The purpose of this evaluation was to examine the participants' self-assessment of perceived competencies related to

the process of follow up of children with hearing loss prior to training and their level of perceived competency after training.

Participants and Setting

Participants in the study consisted of personnel from multiple disciplines who were serving, or may in the future serve, young children identified with a hearing loss. Individuals who were invited to the training consisted of those conducting screening, evaluation, or interventions throughout a statewide network of health districts and birthing hospitals. Others invited were involved in some capacity in the UNHSI process, whether through service coordination, evaluation, or direct service in follow-up interventions. While some of these participants had frequent experience with children with hearing loss, such as working specifically in this area in an intervention capacity, others had very little knowledge but were identified for training as they worked in agencies or in roles where they may in the future serve children with hearing loss or their families in some capacity. Additionally, there were individuals in the training who provided services to preschool aged children with hearing loss, whether directly or through service coordination, but had not worked with these children at the young age at which they were now being identified.

Participants were notified of the training through state level agency interoffice notification, through mailed brochures to individuals on targeted lists of providers, from announcements at meetings, from a statewide speech association website, and from a university based website. This website was specifically designed for the purpose of registration for this training and for further dissemination of information to participants. The training was provided free of charge.

Participants could register for two sets of trainings in four localities throughout the state across a total of eight separate occasions. The total number of participants who attended the 8 sessions was 313. Of these, 156 attended 1 of 4 full day sessions. The second set of 4 trainings was conducted over 2 days and was attended by 157 individuals. There was a duplication of some participants from the first to the second training, by design. A total of 46 individuals attended both sessions of training. Their participation in the self-assessment is not known, as participation was anonymous.

Training Content

The first (one-day) sessions were designed to orient individuals to the process of Universal Newborn Hearing Screening and Intervention. These sessions were designed for individuals who needed some level of information about the process and who possibly would be involved in the process, but were not necessarily direct providers. For instance, persons, such as health care providers or outreach workers, who might encounter children with hearing loss through their positions, were included so they would be aware of the referral process within local districts and understand the implications of early referral on language development.

Collaboration through the district and statewide system of referral and intervention was encouraged in the training sessions. Health district flow charts were displayed on the walls of the training room and participants displayed their photos on the chart depicting their role in the UNHSI system. This allowed training participants to see the direct link for their roles within a larger system and to encourage referral and intervention when the opportunity was present. Photos allowed participants to meet and recognize individuals with whom they may have previously only had phone contact. Flow charts were used at successive trainings allowing for new attendees to add their photos to the charts and to further build the network.

Sessions presented at these one-day orientation to intervention trainings were designed to offer an overview of issues in intervention including current technology, Deaf culture, approaches and strategies for intervention; and to share specific resources within the state and nation for further information. Emphasis was on the benefits of early identification of hearing loss and early intervention to promote language development. The topics for training were identified through a statewide needs assessment. Guest speakers included audiologists in practice in

TESE, **Volume 28, No. 1**
Winter 2005

each geographic region. Parents of a child with hearing loss who was referred early and received intervention brought their child, spoke to the group, and answered questions regarding their personal experience at diagnosis and with the system. A presentation through interactive television allowed two adults who are deaf to discuss their own experiences with the audience. These adults used two different approaches, one oral, the other signing, to give participants different perspectives. Throughout the training, efforts were made to present varying approaches, since participants may not have access to a selection of approaches within the locale where they work.

The remaining four sessions were targeted to individuals who would be participating on a health district referral or intervention team having direct involvement with either the child or the child's family. These later trainings, each scheduled for two consecutive days, specifically addressed Deaf culture, technologies, cochlear implants, and ways of promoting auditory and speech and language development. The first day of these sessions focused on basic intervention such as communication options and orientation to language issues. Technologies such as hearing aids, cochlear implants, and other lifestyle technologies were presented and discussed. Participants were allowed to handle devices and observe features of each. The team concept was emphasized, and family and cultural issues were discussed. Cultural issues included working with families of children with hearing loss in which the parent may also have a hearing loss, as well as working with families who are non-English speaking or for whom English is a second language. A session on motherese and fatherese, specifically related to sign language, was presented.

The second day of this training included models of auditory and speech instruction and levels of auditory perception and spoken language. Auditory games that parents could play with their child to promote babbling and language were presented. Visual games to promote language were demonstrated as well. Case studies were presented to give the participants individual perspectives of children, and present the positive or negative outcomes of their experiences. The focus was on individual differences and the value of early intervention to promote language development.

Procedures

For each of the eight training sessions, participants were given a pre- and post-assessment to evaluate their knowledge and skills related to UNHSI. Measures, data collection, survey return, and data analyses are described in the following sections.

Measures. The items were adapted with permission from the Collaborative Early Intervention National Training e-Resource (CENTe-R) *Proposed Standards for Modules of Study for Professionals Serving Families with Infants and Toddlers who are Deaf/Hard of Hearing* at the University of North Carolina at Greensboro (see website at http://center.uncg.edu) and chosen for their relationship to the goals of the trainings. There were 20 identical items on the pre-assessment and the post-assessment. These were statements of an individual's perception of knowledge or ability to carry out the competency. A complete listing of the items in the self-assessment is in the Appendix. Items 1, 2, 5, 7, 11, 12, 13, 15, 17, and 18 were coded as *knowledge.* Items 3, 4, 6, 8, 9, 10, 14, 16, 19, and 20 were coded as *practice.* The items were not coded when given to participants. Each individual was instructed to rate from one to four how well he or she understood or could perform the item according to the following criteria: 1 = not at all/never heard of this; 2 = aware but uncomfortable; 3 = understand/can do, but need more information; and 4 = understand/can do.

In addition to the items described above, there was also an open-ended portion of the self-assessment. At the end of the post-assessment, participants were given the opportunity to respond to the following two items*: list several points of clarification you received during the presentation; what would you like to learn at a future workshop?*

According to Snyder and Wolfe (1997) self-assessment as a needs-assessment tool can provide feedback to instructors and can guide decisions. The purposes, for which these assessments were conducted, beyond

awareness to the individual participants, included ongoing feedback to the presenter of the training, as well as providing information regarding evaluation and planning for future training.

Data collection. Forms for the pre-assessment and post-assessment were distributed to each participant at the beginning of training with a packet of handouts. Individuals were asked to fill out the self-assessments and were provided the time to do so at the beginning and ending of training. Participants were reminded to return the forms at the end of the day along with other paperwork for continuing education credit.

Survey return. Of the 313 participants in the training sessions, 210 returned pre-assessments and 213 returned post-assessments resulting in a 67% return rate.

Quantitative analysis. The data were entered into the statistical program SPSS Base 10.0 (1999) for each individual participant for each item with points from one to four based upon the individual's self-assessment rating for each of the 20 items pre-assessment and post-assessment. A cross check of data entry was later performed with the assistance of a graduate student to check for any data entry errors. Any items left blank by participants were treated as missing items in the analysis.

The eight sessions of training were divided into the four orientation sessions (sessions one through four) and the four targeted trainings (sessions five through eight). The first two sessions were analyzed separately, as the forms were not coded to match the pre-assessment to the post-assessment for each individual due to an oversight in preparing training materials. For the remainder of the trainings (sessions three through eight) the pre-assessments and post-assessments were given a code number so the data on the two forms could be matched. Individuals were not personally identified; rather their two assessments were coded with an individual number. Methods of analysis included a *t*-test of independent samples for sessions one and two. The remaining sessions were analyzed by MANOVA for sessions three and four (orientation groups) together, and sessions five through eight (targeted training) together. The analyses used the items identified as *knowledge* and *practice* and time one (pre-assessment) and time two (post-assessment) as factors of interest.

Qualitative analysis. The open-ended responses were analyzed using qualitative methods (Krueger, 1988), specifically a code-category-theme process (McWilliam, Young, & Harville, 1996). On the post-assessment, responses were listed verbatim by training session divided by question. As there were two sets of trainings and different topics covered at each, the sessions were grouped into sessions one through four and sessions five through eight. Two of the authors, along with a doctoral student, developed initial themes after each had individually read and reviewed all responses. Themes were discussed and consensus was reached for a listing of themes related to the orientation training and for the targeted training (Krueger, 1988). Raters reread all responses and rated each according to the agreed upon themes. There was agreement on most items. Occasionally two coders were in agreement, followed by consensus by the third after a brief discussion. Additionally, items that the coders agreed were comments, or which were not clear to the coders, were thrown out by consensus. For query one, there were less than 10 items that the raters agreed did not fit within a theme and a similar number that were determined to be comments. There were only 2 items for which consensus was not reached. For query two, there were 3 items that the coders agreed did not fit a predetermined theme. There were 9 items that were comments such as expressions of thanks. Consensus was reached for all items in query two. Responses for each theme are discussed below.

Results

Ratings improved across all item categories (see Table 1). *Knowledge* increased from the beginning of the session (one and two) to the end of the session from a mean of 2.57 to 3.14 ($t = 4.70$, $df = 68$, $p < .01$); for *practice* statements the increase was from 2.30 to 2.65 ($t = 2.70$, $df = 69$, $p < .01$). In sessions three and four of the orientation training, individuals' responses were matched pre- and post-assessment. Means increased

TESE, **Volume 28, No. 1**
Winter 2005

Table 1. Number of Respondents, Means, and Standard Deviations for Knowledge and Practice, by Training Session

Session	Type	Number Responding	Pre-Assessment *M* (*SD*)	Post-Assessment *M* (*SD*)
1 & 2	knowledge	34 & 36	2.57 (.50)	3.14 (.52)
1 & 2	practice	34 & 37	2.30 (.51)	2.65 (.56)
3 & 4	knowledge	74	2.50 (.74)	3.23 (.55)
3 & 4	practice	74	2.25 (.69)	2.81 (.60)
5–8	knowledge	102	2.62 (.71)	3.24 (.57)
5–8	practice	102	2.34 (.67)	2.84 (.62)

Note. Judgments were made on 4-point scales (1 = not at all/never heard of this, 2 = aware but uncomfortable, 3 = understand/can do, but need more information, 4 = understand/can do well).

from 2.50 to 3.23 for *knowledge* ($F = 138$, $df = 1, 73$, $p < .01$) and from 2.25 to 2.81 for *practice* ($F = 102$, $df = 1, 73$, $p < .01$). For the remaining sessions five through eight, which were the targeted two-day trainings, the means for the items related to *knowledge* increased from 2.62 to 3.24 ($F = 151$, $df = 1, 101$, $p < .01$). Respondents' self-assessments increased from 2.34 to 2.84 on the items related to *practice* ($F = 145$, $df = 1, 101$, $p < .01$).

The results of the open-ended responses follow. The first query was: *list several points of clarification you received during the training.* The following themes emerged from the orientation sessions (sessions one through four). Deaf culture was listed by 18% of the participants responding. For example, one respondent stated, "The explanation of Deaf culture will help me". Another stated, "We should be aware of the Deaf culture and respect when their views are different than what we want or think as a non-deaf person". Cochlear implants (16%) was the next most listed theme. A participant stated, "I now have a better understanding of what a cochlear implant is and how it may or may not be the choice for all children who are deaf". The remaining themes were resources that are available (14%), the UNHSI process including referral and roles (12%), auditory testing and audiograms (11%), Auditory Oral/Auditory Verbal (AO/AV) approach (10%), communication modes and options (9%), and sign language (8%).

From sessions five through eight, the targeted training themes that emerged in which participants received clarification are listed as follows (in order of frequency). Statements related to language development, canonical babbling, and auditory development combined were included in 23% of the responses. Some examples included: "The importance of parentese in fostering development of a language base—whether it be visual or verbal"; "The progression of language development"; "Some principles of auditory development"; "Different levels of babbling"; and "Language development in early years—how it occurs". Intervention strategies including games and activities for auditory development and emphasis on the visual presentation such as signing versus spoken language represented 11% of the statements. One respondent wrote, "The actual auditory games presentation was very helpful". Another cited, "The importance of auditory stimulation in the home". Discussion of methods of communication such as signing, total communication, American Sign Language (ASL), Signing Exact English (SEE) made up 9%. Communication modes and options also made up 9%, followed by cochlear implants (8%) and the UNHSI process (8%). Less frequently mentioned were hearing aids (6%), communication with parent-child dyads (5%), and Auditory Oral/Auditory Verbal (AO/AV) approach (5%). A few participants listed Deaf culture, the importance of intervening early, the parent perspective, items of inspiration, and resources.

The second item was: *what would you like to learn at a future workshop?* For sessions one through four, the most frequently mentioned theme for future learning involved intervention techniques and strategies (18%).

Comments from participants included: "More intervention—what works best—how to decide"; "I would like more information on intervention activities for infants and toddlers"; and "Intervention items when teaching". Mentioned next in frequency was the UNHSI intervention and screening process (13%). On the process, one respondent commented, "More in-depth information about the intervention process itself. A step-by-step process to follow once a child is identified with a hearing loss". Other themes mentioned, but with less frequency, include professional development and careers including learning sign language (9%). Mentioned by a few individuals were the team process, communication modes, cochlear implants, working with families, research and technology, transition, and behavior problems.

The most frequently mentioned theme for sessions five through eight involved intervention strategies, mentioned in 24% of the statements. Examples from respondents included: "I would like to see more actual presentation of games used during home visits following the hierarchy of skills to be taught"; "I'd like to gain a clearer example/perspective of how to implement strategies discussed in the regular education classroom and issues related to the 'school age population'"; and "I would greatly benefit from increased emphasis placed on using the visual, gestural, auditory/oral strategies". The theme of intervention strategies was followed in frequency by cochlear implants (15%). Comments on cochlear implants included: "More on management of CI"; and from another individual, "Updates in working with students who have cochlear implants". Next mentioned was the UNHSI process (12%). Mentioned less frequently were funding sources, research, and technology. A few mentioned signing, parent and families, childcare, teams, audiograms, hearing aids, and AO/AV.

Discussion

For this group of individuals from varied backgrounds and disciplines there was a self-perceived level of increase in their *knowledge* and skills to implement services (*practice)* for children with hearing loss after a one or two day training session. These results were supported at the qualitative level as well, where individuals provided specific points of clarification that occurred during the training.

A theme mentioned frequently in the qualitative analysis was the universal newborn hearing screening process, as an area of clarification for participants, as well as an area for future workshops. This had been promoted in training through an emphasis on the roles of each individual in the process, with the use of the flow chart, as well as an emphasis on early identification, intervention, and language development. It seems that persons wanted continuing information on this process once they understood its basis. Cochlear implants were also a frequently mentioned theme in both queries. Some of the parents who spoke at the training sessions had children who had received early diagnosis and cochlear implants, or who were possible candidates for the procedure in the future. This is an area in which advances in technology have opened up new possibilities for children who are deaf, and an area in which experienced practitioners may need additional training, since this technology was not available at the time of their formal education.

An overriding theme from the qualitative analysis was the issue of intervention strategies and techniques. Knowledge of language development, also mentioned frequently as a topic that provided clarification to participants, is an important knowledge base for providing appropriate interventions to children with hearing loss. Knowledge of language development can help individuals develop appropriate interventions to meet the child's needs. These training sessions provided information on both language development and intervention techniques.

These results provide important information to those planning or conducting future training to providers of services for young children with hearing loss. In spite of a perceived gain in knowledge and skills from initial training, service providers who are working with young children with hearing loss perceive they need even further training in intervention techniques and language development. While this was a topic of focus for the training, and individuals re-

TESE, **Volume 28, No. 1**
Winter 2005

sponded that they had gained knowledge in this area, it was the most frequently mentioned topic for future training. Even skilled professionals may encounter the need to expand services to ages younger than emphasized in their formal training, creating a need for training in an array of interventions targeted specifically to the infant, toddler, and preschool age groups.

There are several limitations to this study. While there was a 67% return of the self-assessments, results may have been enhanced if all individuals attending the training had returned the self-assessments. It is important to note that incentives were provided to attend the training. First, the training was provided free of charge and the training offered a convenient way to obtain continuing education credit. It is likely that individuals who stayed for the entire training and who were turning in other paperwork for continuing education credit were those who also turned in the self-assessment. The results may have been different if all had responded. For example, individuals with less interest in the field may have left early if the training was not as relevant to them. From the other perspective, some of those individuals who work daily in service coordination related to this process attended the sessions, but may not have filled out the forms, as their attendance may have been to show support for the UNHSI process.

Another limitation was that the forms were not coded for the first two groups. This coding would have allowed for a larger group in the analysis of the first four sessions. Additionally, some participants attended both sessions, which perhaps affected their rating. Further, this study is limited to results from one southeastern state and the results may be different with providers in other states. The authors were involved in planning the training, and each promotes the UNHSI process and early identification and referral of children with disabilities, which may have led to bias on the authors' part.

Self-assessment, while providing information regarding opinions of participants related to training, cannot be used to infer actual changes in participants' behavior as a result of training. The results, however, provide information about the participants' perceptions of what they thought they learned and what they would like to know about hearing loss in young children and its implications for early intervention. These results may be helpful to those in personnel preparation or those providing training to providers of early intervention services in this area.

It would be interesting to gather data on the specific disciplines of the respondents relative to their responses. While discipline information was obtained separately during registration for the training, it was not included on the pre-assessments and thus could not be utilized in considering the results. The ability to consider themes by discipline may enhance planning for future training.

Recommendations for Further Study

Most of the individuals targeted for this study worked with children in the birth to three years age group, as this was the targeted group for training. There are, however, many providers who have skills through their professional discipline who could be targeted for training with younger children with hearing loss, specifically, audiologists, speech and language pathologists, special educators, nurses, and service coordinators. Further training with these groups to enhance their skills with younger children might be valuable. As children with hearing loss are identified earlier, and as technology such as hearing aids, acoustical modifications, and cochlear implants continue to improve, these children will be involved in services earlier, and should enter school at an improved level of readiness, thus changing the emphasis of former services. It would be beneficial for providers receiving children with hearing loss to be trained and ready for the group of children who are being identified and receiving interventions at a much younger age. Additionally, future training might incorporate systematic follow up to further enhance the skills of participants after the formal training.

Implications for Practice

As service delivery to children under IDEA (1997) emphasizes a multidisciplinary evaluation and team approach, providers from various disciplines need to continue to find ways to mutually meet shared goals for

each child. It is important that providers of young children with hearing loss enhance their ability to foster goals that are priorities for other disciplines. Joint training of these professionals is a means of training efficiently, and can help foster stronger teams by providing opportunities to enhance working relationships and share common goals or practices. The mutual training provides opportunities for all providers to hear the same information together, and it allows for knowledge to be presented in a way that each provider can use within the particular discipline. Further, training from a multidisciplinary focus allows providers from various backgrounds, multiple workplaces, and from a variety of agencies serving various ages to come together for a mutual purpose and shared training goals. As one participant commented, "As an audiologist, I work more on the identification and less on the intervention/education—I need to be reminded of the importance of both processes". These connections may further enhance collaboration and services for children beyond that intended by the training itself.

Providers from various disciplines perceived that training conducted jointly in a short period of time (one or two days) was effective in enhancing their knowledge and skills related to the universal newborn hearing screening and intervention process. Knowledge in specific targeted areas was shown to increase in terms of the participants' self-assessments from pre-assessment to post-assessment and was verified through qualitative analyses. As the Goals for Healthy People 2010 (U.S. Department of Health and Human Services, 2000) promote infant screening and intervention at a much younger age than was previously emphasized or even thought possible prior to new technologies, the need to train more providers can be more efficiently met if they can be trained by combining individuals from various disciplines and those who are currently serving various age groups. From the perception of the participants in this study, it is possible to increase knowledge and the ability to implement interventions with families of infants and toddlers with hearing loss in a relatively short training period.

Appendix

Self-Assessment of Knowledge and Skills: UNHSI

Pre-Assessment and Post-Assessment

Rate from 1 to 4 Based on How well you understand or can perform the items below

1 = not at all/never heard of this
2 = aware but uncomfortable
3 = understand/can do, but need more information
4 = understand/can do well

Knowledge or Skill

1. I understand and can apply IDEA and other legislation related to deaf and hard of hearing children (D/HH).
2. I understand the history of deaf education and the relationship between philosophies and outcomes.
3. I understand and can use the services of interpreters and interpreting agencies.
4. I know how to develop a transition plan for a child who is D/HH.
5. I understand how newborn hearing screening is conducted and why.
6. I can locate services and resources for D/HH babies and their families.
7. I understand my role within the context of Georgia's UNHSI service model.
8. I know how to engage the family of a child who is D/HH in the intervention process.
9. I am able to communicate with families who do not use my language (e.g., Spanish).
10. I am able to communicate in ASL with the Deaf parents of a deaf infant or preschooler.
11. I understand the unique contributions of the Deaf culture to a deaf child's development.
12. I understand the difference between ASL and the different English-based sign systems (e.g., SEE, Signed English, CASE).
13. I understand the difference between Auditory-Oral and Auditory-Verbal instruction.
14. I can work with children differently under the principles of Auditory-Oral and Auditory-Verbal instruction.

TESE, **Volume 28, No. 1**
Winter 2005

15. I understand the difference between Total Communication and ASL Bilingual instruction.

16. I can work with children differently under the principles of Total Communication and ASL Bilingual instruction.

17. I understand the principles of auditory development (such as levels of perception, levels of skill, and levels of difficulty).

18. I understand the different abilities and skills needed to work with children who are deaf or hard of hearing from birth to 2 years of age versus the abilities and skills needed to work with children who are deaf or hard of hearing in the 3 to 5 year age range.

19. I understand how to read and apply information from an audiogram.

20. I understand how to use and troubleshoot problems of hearing aids and cochlear implants.

Items were coded as follows for analysis:

knowledge: items 1, 2, 5, 7, 11, 12, 13, 15, 17, 18;
practice: items 3, 4, 6, 8, 9, 10, 14, 16, 19, 20.

Adapted with permission from the CEN-Te-R *Proposed standards for Modules of Study for Professionals Serving Families with Infants and Toddlers who are Deaf/Hard of Hearing* at the University of North Carolina at Greensboro (see website at http://center.uncg.edu)

Note: This instrument is available from the second author upon request.

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